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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,223	12/07/2001	Jong-Chull Shon	1594.1013	5569
21171	7590	04/21/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			HE, AMY	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/005,223	Applicant(s) SHON ET AL.	
	Examiner Amy He	Art Unit 2858	<i>mi</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 15-16, 20-21 and 26-29 is/are rejected.
- 7) ☒ Claim(s) 2, 4, 6-14, 17-19 and 22-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9/11/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 3, 15 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Wakabayashi et al. (U. S. Patent No. 3, 848, 218).

Referring to claims 1 and 15, Wakabayashi discloses a polymer-type humidity sensor (10 in Figures 1-2) comprising:

a polymer structure (1 in Figures 1-2) of a predetermined shape, wherein said polymer structure comprises a rubber (column 2, lines 47-48) and carbon(column 3, lines 25-27) mixed in said rubber; and

a pair of electric terminals (3-4 or 5-6 in Figures 1-2) contacting said polymer structure (column 1, lines 48-54) to measure an impedance to determine a relative humidity (see Figure 4).

Referring to claim 3, Wakabayashi discloses the polymer-type humidity sensor of claims 1, wherein the polymer-type humidity sensor has a resistance in a range of 500 K-2M ohms (2.7K-17M, see column 6, table 1).

Referring to claim 26, Wakabayashi discloses a polymer-type humidity sensor (10 in Figures 1-2) comprising:

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a polymer structure (1 in Figures 1-2) having opposing ends, wherein said polymer structure comprises a rubber (column 2, lines 47-48) and carbon(column 3, lines 25-27); and

electric terminals (3-4 or 5-6 in Figures 1-2), each contacting a corresponding one of the opposing ends of said polymer structure (column 1, lines 48-54).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakabayashi et al. (U. S. Patent No. 3, 848, 218), in view of Tachikawa et al. (U. S. Patent No. 6, 375, 863).

Referring to claims 5 and 16, Wakabayashi discloses the polymer-type humidity sensor of claim 1, wherein a rubber (column 2, lines 47-48) is used to make the polymer structure. Wakabayashi does not specifically disclose NBR-Acrylonitrile Butadiene as the rubber used. Tachikawa discloses the claimed NBR- Acrylonitrile Butadiene rubber (column 6, lines 5-8). A person of ordinary skill in the art at the time the invention was made would find it obvious to modify Wakabayashi to use NBR- Acrylonitrile Butadiene rubber, or other type of polymer of rubber, as taught by Tachikawa, in order to reduce time by using materials of high moisture-absorbing and desorbing properties.

3. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (U. S. Patent No. 5, 847, 261), in view of Wakabayashi et al. (U. S. Patent No. 3, 848, 218).

Referring to claim 20, Lee discloses a microwave oven (10 in Figure 1) to cook food comprising:

- a body including a cooking cavity (300);
- a heating element (100 and 200) to cook the food in the cooking cavity(300);
- an air outlet unit (311, 321 and 331) to discharge air from the cooking cavity;
- a control unit (800) which controls the cooking of the food; and
- a polymer-type humidity sensor (vapor sensor 800) disposed at said air outlet to obtain information on a humidity content of the discharged air for use by said control unit, wherein said polymer-type humidity sensor

Lee does not specifically disclose that the humidity sensor comprises:

- a polymer structure having a rubber and carbon;
- a pair of electric terminals contacting the polymer structure to measure an impedance to determine a relative humidity.

Wakabayashi discloses the polymer structure (1) having natural rubber and carbon, and a pair of electric terminals (3-4 and 5-6) contacting the polymer structure to measure an impedance to determine a relative humidity (see Figure 4).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lee to replace the vapor sensor (800) with the humidity

sensor using polymer structure comprising natural rubber and carbon, as taught by Wakabayashi, in order to ensure operation of the humidity sensor at high humidity level (Wakabayashi reference, column 1, lines 9-14).. Since the ceramic sensing element in Lee does not have sufficiently high stability at high humidity.

Referring to claim 21, Lee further discloses a cooling fan (400 in Figure 1), which draws atmospheric air into the cooking cavity while cooling said heating element.

4. Claim 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakabayashi et al. (U. S. Patent No. 3, 848, 218).

Referring to claims 27-29, Wakabayashi discloses a planar polymer structure (1 in Figure 1-2). Wakabayashi does not disclose a cylindrical or a prismatic shape. It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wakabayashi to include a cylindrical shape or a prismatic shape with rectangular cross-section, or any other suitable shape as desired, depending upon the situation and the shape of contacting surface, in order to increase the stability of the humidity sensor in an environment under test. Since it has been held that changing the form/shape of an invention involves only routine skill in the art. *In re Dailey*, 149 USPQ 47 (CCPA 1976).

Allowable Subject Matter

5. Claims 2, 4, 6-14, 17-19 and 22-25 are objected to as being dependent upon a rejected base claims (claims 1, 15 and 20), but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 2, 4, 6-14, 17-19 and 22-25 are allowable because none of the prior art discloses that the carbon added to the polymer structure is in a range of 15-20% plus or minus 5% volume, and in the combination as claimed.

Response to Arguments

6. Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy He whose telephone number is (571) 272-2230.

The examiner can normally be reached on 9:30am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (571) 272-2233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

AH
April 19, 2004


N. Le
Supervisory Patent Examiner
Technology Center 2800